Creative Writing Activities

1. Write a creative description of a creature (fish) that might live in your lake. Consider all the facts you know about your lake - temperature, pollution, plant life, etc.

2. Write a myth or legend to explain how your lake came into existence.

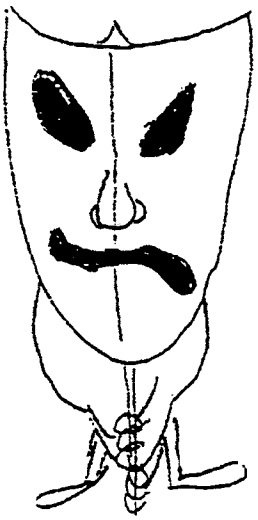
3. Write a creative story about the fish that got away.

4. Create a fish which might live in your lake.

5. Write a story about why people settled near your lake.

Drama for Water Unit

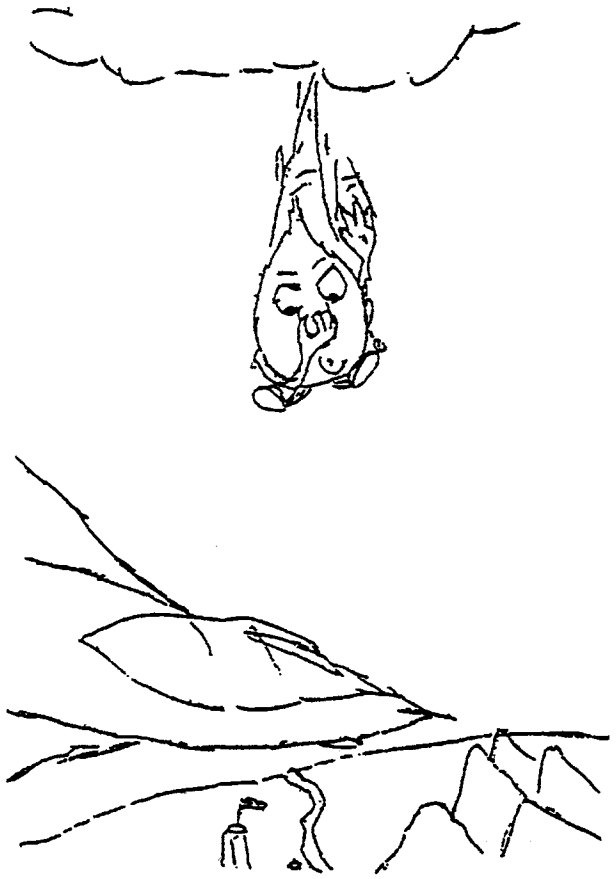
On "Dry Dock" days, the Language Arts Department may select plays with water themes for the students. Suggested activities would include dividing the class up into "play groups" to rehearse a "public reading" for the class with the play they are assigned. Some groups may want to truly make a production out of their play. The "director" of each "play group" should have their group list the setting, plot development, and traits of characters in their play. This information can be shared with the entire class either before or after the presentation of particular plays.



Create A Rainfall In Your Classroom

Produce neatly written or typed expressions or quotations about water. These could include common phrases such as "I'm in hot water now" and "That's water under the bridge." Or perhaps verses to particular songs such as "The Itsy Bitsy Spider" could be written. In addition, the use of books such as Bartlett's Book of Quotations could produce "water" quotes.

After peer editing and proofreading, glue one expression/quote to each raindrop.* Tie yarn or string through a hole in the top of the drop. The teacher can then suspend several drops from the ceiling creating a great visual effect.



HELP CLEAN UP THE GREAT LAKES

1. Before the lamprey eel was controlled, it threatened to destroy most of the fish population of the Great Lakes. Write the Department of Natural Resources from one or more states bordering the Great Lakes and ask for information on what they are doing to combat the lamprey eel. Discuss what you might do to help.
2. The zebra mussel is a new pest that was brought to the Great Lakes from ocean-going vessels. The fast-growing mussel attaches itself to water intake pipes in the lake and clogs up the pipes, causing water shortages. Controlling this problem is very costly. Write the Water Departments of one or more cities on the Great Lakes and ask:
   * if they have a zebra mussel problem
   * what they are doing or plan to do to combat it.
3. The cost of cleaning up the pollution of the Great Lakes will be billions of dollars. However, 40 million people live in states that border the lakes. The cost might average out to less than one week's grocery bill per person. Discuss whether it would be worth this cost to clean up the Great Lakes.
4. The detergents (soaps) we use in our homes today contain phosphate, which is food for algae (a water plant). Algae is bad for the lakes because it smells bad when it dies. When it rots, it takes oxygen out of the water and causes fish to die. Have a class discussion on ways you could control the problem caused by detergents.
5. The Great Lakes are bordered by some of the world's richest farmland. However, the farmland is responsible for some of the Great Lakes' pollution problem. Erosion washes soil into the lakes and makes the water too shallow for shipping lanes near the shore. Fertilizers and insecticides wash into the water and cause some fish and species of birds to die. Ask a member of the Department of Natural Resources to talk to your class about the problem. Ask a representative from the Co-op Extension Office to explain what farmers are doing to help with the pollution problem.
6. Industrial wastes are made up of toxic chemicals. Some 360 hazardous chemicals run off into the Great Lakes. Some of these contaminants are also airborne. These toxic chemicals cause tumors in fish and birth defects in birds that eat the fish. Will the same thing happen to humans that eat the fish? Invite a representative of the Public Health Department, National Wildlife Federation, or United Conservation Club to discuss with your class what is being done and what needs to be done to stop the problem of industrial waste runoff in the lakes.

ACTIVITIES

1. The Great Lakes are connected by rivers and canals. Pretend you are on a ship and trace all the waterways you will travel from upper Lake Superior to Lake Ontario.
2. Pretend you are an early explorer. Study the map of the Great Lakes region.
3. Milan, Ohio, built a canal to open ;up commerce to the Great Lakes in 1839. Eight years later, a famous inventor was born in Milan. Find out who the inventor was and read about some of his famous inventions.
4. The usual full-length trip on the lakes was from Buffalo to Duluth. Find these two port cities on a map. What is the distance between the two?
5. Read the mysterious story of the *Maud S.,* a Great Lakes schooner. Read about her ocean counterpart, the *Mary Celeste,* and report on these unusual stories.
6. The lore of the lakes gives chilling accounts of Great Lakes storms that have destroyed ships and lives. These storms have been given names. Three of the worst that ever occurred were "The 1905 Blow," the "Big Storm of 1913", and "The Armistice Day Storm of 1940." Read about these storms and report to the class.
7. Identify the eight states that border the Great Lakes. Write the Tourist Commission from each of these states and ask for information about Great Lake industries, recreation, and tourist attractions.
8. Make a list of the U.S. Presidents that came from states bordering the Great Lakes.
9. The story of a Lake Superior Indian Tribe was told by Henry Wadsworth Longfellow in his poem, *Hiawatha.* Read or ask your teacher to read excerpts from this poem.
10. Write the curator of the Canal Park Marine Museum in Duluth, Minnesota, and ask him for information on major storms, sunken ships, or some other specific topic relating to the Great Lakes.
11. Do a map search and find the following:
    a. Johnson's Island (Civil War prison camp)
    b. Put-In-Bay (site of Commodore Perry's naval victory over the British in the War of 1812)
    c. Straits of Mackinac
    d. Georgian Bay
    e. Manitou Island
    f. Sault St. Marie
12. Scientific advances in detection devices and salvage equipment have made the discovery and raising of sunken ships for easier than it was in the past. Form a Ship-wreck Exploration Group in your class and plan a salvage operation. Write the Curator of Maritime History, Smithsonian Institute, Washington, D.C., and ask him for information on how to find and raise a Great Lakes ship. You may also wish to ask for other specific information relating to the Great Lakes.

WATER

WATER ACTIVITY: "THE UNIVERSAL SOLVENT"

BACKGROUND

What is a solvent?

Anything that will dissolve another substance.

A. Solvents break substances into ions.

B. Most solvents are liquids. A few are gases.

C. Solvent + Solute = Solution REMEMBER?

D. Water will dissolve more substances than any other liquid. (This is why it is called the Universal Solvent)

THE ACTIVITY -

Purpose:

Each lab group will receive ten common solid substances. Their task will be to determine which substances are soluble in water.

Equipment:

- 3 test tubes
- a test tube rack
- a 50 ml beaker
- rubber stopper #4
- a test tube hand clamp
- a stirring rod
- a Bunsen burner
- solute samples

Procedure:

A. Put about 1 inch of water in a clean test tube.

B. Place two or three crystals of a solute in the water.

C. Shake the test tube with the stopper in place.

D. If you are not certain, carefully heat the sample to help the dissolving process. *Note: do not boil!

E. Record whether the substance is soluble in water.

F. Determine what percentage of the samples were soluble in water on the attached chart.

SAMPLE NAME	IS IT SOLUBLE?	
	YES	NO

SAMPLE NAME	IS IT SOLUBLE?	
	YES	NO

WATER

WATER ACTIVITY: DEW POINT

WATER IN THE AIR - WATER VAPOR OR HUMIDITY

BACKGROUND

A. When water evaporates, water molecules enter the air and take up spaces between regular air molecules.
B. The amount of water vapor in the air is called humidity.
C. The amount of water vapor that air can hold is determined by the air temperature.
D. The warmer the air, the more water it can hold.
E. When the air is full of water, it is said to be saturated.
F. The temperature at which air becomes saturated is its DEW POINT.

THE ACTIVITY

Purpose:

To determine the dew point of the air in this room.

Equipment:

A polished metal dish or cup
A thermometer
crushed ice

Procedure:

A. Fill the polished dish 3/4 full of room temperature water.
B. Place the thermometer in the water, and drop in some crushed ice.
C. Stir the ice water with the thermometer, while watching the outside of the polished cup for the first sign of condensation.
D. When you first see a film of "Dew" form on the cup, immediately read the thermometer.
E. Record Below

Date_____

Dew Point_____

WATER

WATER ACTIVITY: THE ELECTROLYSIS OF WATER

THIS ACTIVITY WILL BE CARRIED OUT AS A DEMONSTRATION

Purpose:

To separate the water molecule into its element components using an electrical current.

Demonstration Procedure:

A. Explain the apparatus set up and how it works.

B. While the reaction is progressing, the following questions will be addressed -

1. Is one electrode collecting more gas than the other?

2. Which electron is producing oxygen? Hydrogen?

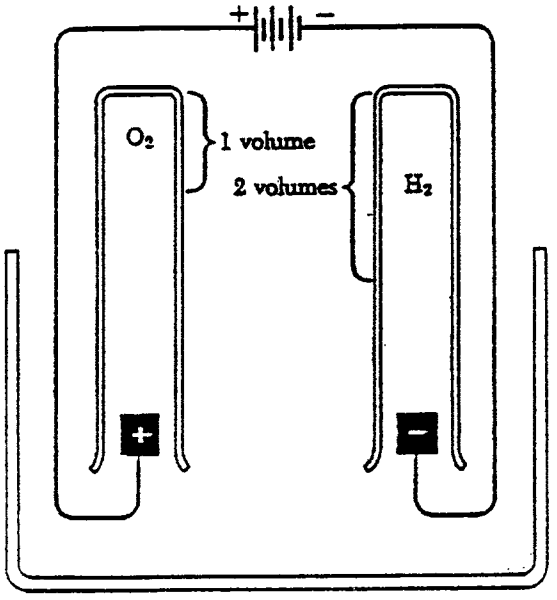
3. Why is there more hydrogen than oxygen?

C. After the test tubes are full -

1. Hold a flaming splint to the mouth of each test tube.

2. Thrust a glowing splint into the test tube that didn't react in #1.

Explain what happened in each test.



WATER

WATER ACTIVITY: THE POLAR MOLECULE-SURFACE TENSION

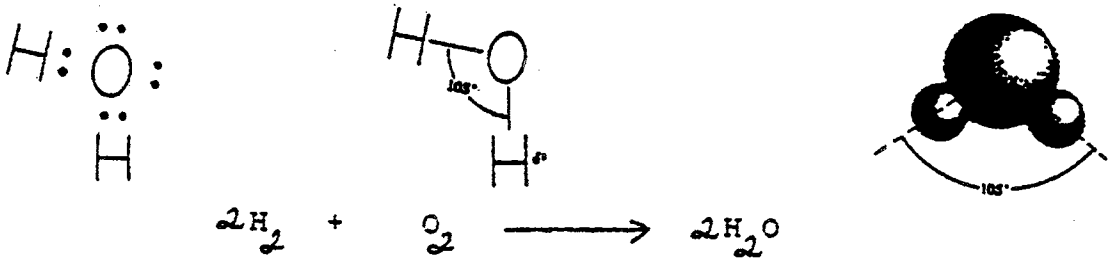
BACKGROUND

The Water Molecule

A. The water molecule is held together by a covalent bond
Oxygen shares a pair if electrons with two + hydrogen atoms. See drawing below.

B. The water molecule is a polar molecule

1. A polar molecule has a positive and a negative side. Like a tiny magnet.



2. Polar molecules are attracted to each other by a rather weak bond.
3. Below 32°F water molecules attach to each other positive ends to negative ends. This results in elaborate crystals. Snowflakes and frost

C. Liquid water has <u>surface tension</u>

Water molecules cling to the sides of their container causing a miniscus.
Water will crown up in a full container.
Surface tension will allow a needle to float on its surface.

The Activity -

Purpose:
To demonstrate water's surface tension

Equipment:
A large drinking glass
Tap water
3 small sewing needles (a variety of sizes may be used)
A small pouring beaker (30 ml)

Procedure:

A. Fill the beaker until you can see the surface of the water crowns up above the top of the container.
Tell why this happens.

B. Now take a steel sewing needle and try to get it to float on the water. (You get three needles to accomplish this - needles must be held between fingers parallel to the surface of the water and dropped gently onto water surface)
Note: Density of Steel 7.8 g/ml
Density of Water 1.0 g/ml

Explain why this happens.

WATER

WATER ACTIVITY: THE DISTILLATION OF WATER

(THE WATER CYCLE IN A TUBE)

BACKGROUND

A. Water exits on this earth in three basic forms - solid (ice), liquid, gas (water vapor).
B. Water has a rather small temperature range between each of its matter forms.
C. Water exists: As a solid below 32°F
As a liquid between 32°F and 212°F
As a gas above 212°F
D. Solvents and solutes can be separated by the distillation process.
Distillation - the evaporation of a solvent, transporting it to another place, and condensing it.
E. The Liebig condenser can demonstrate the water cycle in the atmosphere.

THE ACTIVITY

Purpose:

Each lab group will create a solution by dissolving several substances in a 250 ml of water. They will then use a Liebig condenser to separate the water from the solute. In the process, they will be able to view the hydrologic cycle.

Equipment:

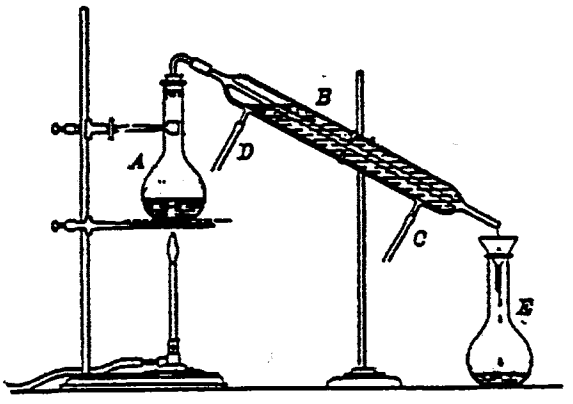
1 500ml Flask	2 ring stands
stopper-tubing connector	1 ring clamp
1 Liebig condenser	1 bunsen burner
A 250 ml beaker	wire gauze
2 sections of rubber tubing	2 stationary test tube clamp

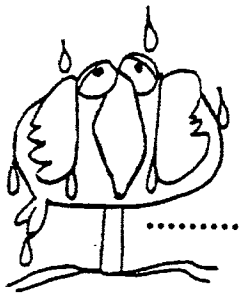
Procedure:

1. Set up your apparatus as shown below
2. Connect rubber tubing to position C on the condenser and the other end to the water spigot.
3. Connect the other rubber tubing to outlet D. The other end should be in your sink.
4. Place the solution in your flask and light your bunsen burner.
5. Begin to circulate cool water through your condenser.
6. Begin to heat your flask, bringing the solution to a boil.

Observations:

1. Why is cold water admitted at C rather than D?
2. How is the distillate in your beaker different from the solution in your flask?
3. What water form changes are taking place through this process?
4. Relate these changes to the hydrologic cycle.





Dripping Wet

Relative Humidity (Per Cent)

Difference in Wet Bulb and Dry Bulb Readings (°F)

Air Temperature (°F)	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	15°	20°	25°	30°	35°
20°	85	70	55	40	26	12									
25°	87	74	62	49	37	25	13	1							
30°	89	78	67	56	46	36	26	16	6						
35°	91	81	72	63	54	45	36	27	19	10					
40°	92	83	75	68	60	52	45	37	29	22					
45°	93	86	78	71	64	57	51	44	38	31					
50°	93	87	80	74	67	61	55	49	43	38	10				
55°	94	88	82	76	70	65	59	54	49	43	19				
60°	94	89	83	78	73	68	63	58	53	48	26	5			
65°	95	90	85	80	75	70	66	61	56	52	31	12			
70°	95	90	86	81	77	72	68	64	59	55	36	19	3		
75°	96	91	86	82	78	74	70	66	62	58	40	24	9		
80°	96	91	87	83	79	75	72	68	64	61	44	29	15	3	
85°	96	92	88	84	80	76	73	69	66	62	46	32	20	8	
90°	96	92	89	85	81	78	74	71	68	65	49	36	24	13	3
95°	96	93	89	85	82	79	75	72	69	66	51	38	27	17	7
100°	96	93	89	86	83	80	77	73	70	68	54	41	30	21	12
105°	97	93	90	86	83	80	77	74	70	69	55	43	33	23	15
110°	97	93	90	87	84	8	78	75	73	70	57	46	36	26	18
115°	97	94	91	88	85	82	79	76	74	71	58	47	37	28	21